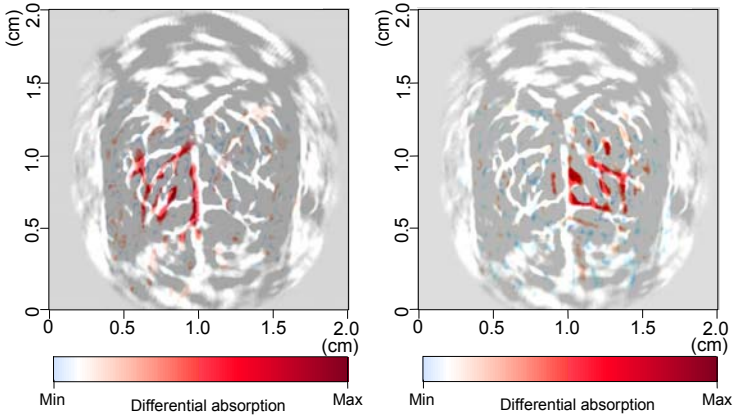
Functional Brain Imaging by Laser Induced PAT (PAT: Photoacoustic Tomography)

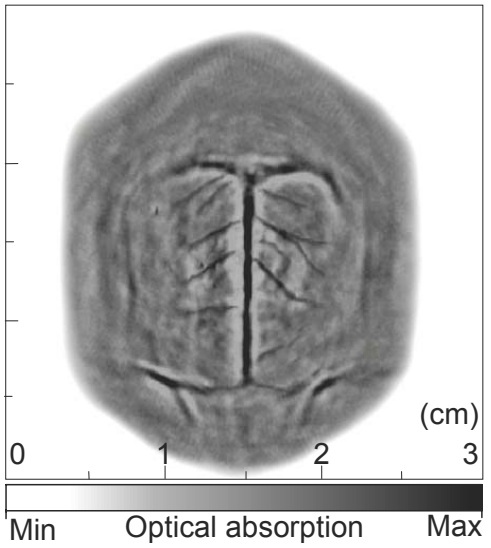
- PI of BRP: Lihong V. Wang, PhD, Texas A&M Univ.
- Partners: George Stoica, DVM & PhD (Texas A&M Univ.) and Quing Zhu, PhD (Univ. of Connecticut).
- Consultants: Kirk Shung, PhD (Univ. of Southern Cal.) and King Li, MD (Clinical Center, NIH).
- Objective: To develop a novel non-invasive laser-based technology for transcranial functional imaging of the brain of small animals in vivo.
- Funding institute: NINDS.
- Reference: Nature Biotech. 21, 803 (2003).
- URL: oilab.tamu.edu



http://oilab.tamu.edu -- 2004

Technology and Progress

- Approach: Photoacoustic tomography (PAT) that combines functional optical contrast with diffraction-limited ultrasonic resolution.
- Strengths of technology:
  - High resolution: 30-60 microns.
  - Good penetration: several cm.
  - High sensitivity: ~fmol.
  - No speckle artifact.
  - Functional imaging.
  - Molecular imaging.



- Status: We achieved functional PAT of rat brains in vivo to assess both the cerebral blood volume and oxygenation of hemoglobin simultaneously.